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Coping with anthelmintic resistance in ruminants: the potential use of chicory (*Cichorium intybus*) as an antiparasitic forage in cattle

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Studies were performed to test the anthelmintic activity of chicory against cattle nematodes and to investigate the role of sesquiterpene lactones (SL) as active compounds. In study 1, 2-4 months-old calves were allocated into a chicory (CHI, n=9) or control (CON, n=6) group. CHI and CON were stabled and fed with chicory silage (cv. Spadona) or hay, resp., ad libitum. After 2 weeks all calves were infected with 10,000 *Ostertagia ostertagi* and 65,000 *Cooperia oncophora* third-stage (L3) larvae. In study 2, 4-6 months-old calves were allocated into a chicory (cv. Spadona, CHI, n=10) or ryegrass/white clover (CON, n=10) pasture. After 1 week all calves were infected with 20,000 *O. ostertagi* L3 larvae. Fecal egg counts were calculated as number of eggs per g of dried feces (FECDM). At day 56 (study 1) and day 36 (study 2) post-infection calves were killed for worm recovery. FECDM and worm counts were analysed by ANOVA. In study 3, SL extracts were purified from leaves of chicory cv. Spadona and cv. Puna II. *O. ostertagi* adults were incubated at decreasing concentrations of SL extracts and worm motility was evaluated after 6, 24 and 48 h of incubation (37oC). SL profile in the extracts was analysed by liquid chromatography (LC). In study 1 mean FECDM were not significantly different between groups. *O. ostertagi* mean worm counts were 1599 and 3752 in CHI and CON groups, respectively ($P<0.05$). *C. oncophora* burdens were not statistically different between groups. In study 2 FECDM was decreased in CHI by 48-65% as compared to CON ($P<0.05$). Worm counting of study 2 is undergoing. In study 3 Spadona-SLs showed higher potency and exerted faster worm paralysis than Puna II-SLs. LC analyses revealed a different composition of SL between cultivars. In conclusion, chicory demonstrated a marked in vivo anthelmintic effect against *O. ostertagi*, but not on *C. oncophora*. Different anthelmintic potency of chicory SL can guide the identification and selection of antiparasitic cultivars.